six hours. The frequency of catheterization was gradually reduced with increasing spontaneous voiding. The procedure was stopped when the residual urine was less than 150 ml. The period of intermittent catheterization varied from 39 to 138 days (mean 79 days) in acute patients and 3 to 25 days in chronic patients. A separate program was used for acute and chronic patients. The patient's profile of fluid balance and urinary culture was done before the start of intermittent catheterization. All catheterization was done aseptically by paramedical personnel and all paraplegic patients were trained to catheterize themselves. The role of bethanechol chloride as a bladder assist for decreasing period of intermittent catheterization has also been evaluated. Optimal dosage which halved the period of catheterization has also been established. Almost all patients with Foley indwelling catheters at the start of intermittent catheterization were infected; however, after intermittent catheterization about 75 percent were infection free. Overall 92 percent catheter-free status was achieved without operation on the bladder neck. One of the important goals was to do minimal operation, and a conservative bladder neck sphincterotomy to avoid incontinence has been advocated. Such an operation was done on six patients and the results improved to 98 percent catheter-free status.

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Treatment of the Frozen Shoulder

ADHESIVE CAPSULITIS of the shoulder is an established clinical entity associated with chronicity and numerous therapeutic regimens.

It is characterized by pain in the shoulder during the first three months, then loss of pain but persistent limitation of motion in the next three months. Spontaneous recovery is reported in 60 percent of patients.

Types of treatment vary: (1) orally administered medicine of the phenylbutazone series; (2) exercises, active and with avoidance of gravity during the painful "hot" period of the first three months with avoidance during this phase of vigorous or passive manipulative exercises; active assistive exercises during the subsequent painless "frozen" phase; (3) if arthrography shows a "cuff tear," orally administered anti-inflammatory agents and active exercises or (4) suprascapular nerve block combined with active exercises.

More recently, there have been encouraging results from local injection of depot corticosteroids in the supraspinatus tendon, biciptal tendon and capsular area given in a series. However, emphasis is still placed on pain relief and gradual regaining of the range of motion.

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Fibrillation Potentials in Upper Motor Neuron Disease

CLINICAL ELECTROMYOGRAPHY (EMG) is a useful tool in helping to distinguish normal from abnormal functions of muscles. The finding of fibrillation potentials on EMG in patients with hemiplegia secondary to cerebrovascular accident was first reported in 1967. This finding was confirmed and the subject reviewed in a recent article by Kruger and Waylonis. Fibrillation potentials have also been reported in patients with upper motor neuron paralysis secondary to spinal cord injury. The possible explanation for the origin of these abnormal potentials in patients with upper motor neuron disease is discussed in the recent article by Taylor, Kewalramani and Fowler.

Fibrillation potentials are probably the most common and certainly the easiest to recognize of the abnormal potentials observed in clinical EMG. Early clinical studies plus experimental studies with animals and man led to the concept that fibrillation potentials are characteristic of (lower motor neuron) denervation. As a result, the term fibrillation potential has become synonomous with "denervation" in clinical practice. In light of the above reports of fibrillation potentials in patients with upper motor neuron disease, plus the experimental studies by Josefsson and Thesleff demonstrating that fibrillation potentials occur in experimental animals when release of acetylcholine is blocked with botulinus toxin, the concept that fibrillation potentials are synonomous with dener-

vation is no longer acceptable. They have also been described in myopathic diseases as well as in the conditions described here.

The significance of these findings is that the practice of using the word "denervation" or "denervation potentials" in the EMG report to indicate that fibrillation potentials were observed should be discouraged. The fact that fibrillation potentials are always abnormal is not questioned, however, we should report only that fibrillation potentials were found and the pattern or distribution in which they were found. The final conclusion as to whether or not they represent denervation is based on: (1) the distribution of the abnormal findings, (2) the characteristics of the voluntary potentials, and (3) clinical observations.

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Treatment for Bell's Palsy

IN THE MANAGEMENT of Bell's palsy there is controversy as to (1) reliable assessment of prognosis and (2) effectiveness of proposed "curative" treatment regimens. To place these issues in proper perspective, one must understand three variations of the natural course of the process. The majority of patients (65 to 85 percent) *recover fully* within a few weeks to approximately two months *without therapeutic intervention.* Of the remaining patients, approximately one-half experience partial nerve regeneration which delays adequate recovery to between two and six months. The remainder, or approximately ten percent of the total number, experience either slow recovery or else a recovery that is cosmetically unsatisfactory because nerve regeneration is insufficient to restore the denervated muscle fibers.

Valid criteria for assessing prognosis and actual degree of risk of nerve degeneration should be the basis for selecting patients for "curative" treatment.[4] This would avoid treating many persons unnecessarily and would be effective in protecting those at greatest risk from unsatisfactory cosmetic results.

One method of selection being studied is the use of electromyography to distinguish partially paralyzed from totally paralyzed facial muscles. Daily examination after onset serves to define the completeness of the palsy during the process and hence the risk of nerve degeneration. Additionally, response to high-dose prednisone or any other treatment is noted day to day as a measure of effectiveness.

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New Prosthetic Appliance

A NEW DEVICE called the modular above-knee prosthetic appliance has been developed at Bellevue Hospital, New York City. It consists of an above-knee prosthetic attachment with a quadrilateral socket that contains an inflatable plastic pad to accommodate immediate post-operative fitting of any stump. This modular device has the advantage of avoiding undue delay in ambulation for a debilitated geriatric patient while waiting for the preparation of a conventional prosthetic limb. It provides a well-fitting socket to assure comfort; it can be mass produced and the "modular" component may be shipped to remote areas where prosthetists are not available.

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PICA Test for Aphasia

APHASIA RESULTING from a cerebral vascular accident may cause considerable frustration and depression for the patient, as well as for the family. In the past, instruments to evaluate the disability, to predict recovery and to assess progress were imprecise, tended to be subjective and were difficult to interpret. Furthermore, it was difficult to determine when the patient had reached his maximum potential.

The Porch Index of Communicative Ability